Energy Audit Report

Town of Amenia Town Hall

Amenia, NY

Prepared By:

L&S Energy Services, Inc.
58 Clifton Country Road
Suite 203
Clifton Park, NY 12065

RLW Analytics, Inc.
48 4th Street
Troy, NY 12180

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ABSTRACT

The purpose of the study was to investigate and report on the effects of installing various energy conservation measures for a town hall and office building. An on-site visit was conducted by an experienced energy auditor familiar with this type of facility. Data was gathered during the site survey through visual inspections of building equipment and review of utility bills.

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SUMMARY

A summary of the recommended energy conservation measures with payback periods of less than 10 years is shown in Figure 1. If all of the recommended items were implemented, the total savings would be $16,404 for a overall payback of 4.8 years.

Some of the measures are eligible for Existing Facilities Program incentives totaling $5,770 as shown on Figure 1. The incentives for the Existing Facilities Program were estimated using the Pre-Qualified forms, which have a rebate per eligible item. These incentives could reduce the installed cost to $72,174 and the payback would be reduced to 4.4 years. Figure 2 shows ten year cash flow analyses, with and without financing.

Figures 3 and 4 show how the building uses energy. Figure 3 is by energy use and Figure 4 is by energy cost. Figure 5 is a summary of equipment and estimated run hours. Figure 6 is a monthly energy use summary for electricity. Figure 7 is a monthly energy use summary for heating oil.

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FIGURE 1 - PROJECT COST, ANNUAL SAVINGS AND PAYBACK SUMMARY

ECM #	ECM Code	Energy Conservation Measure (ECM) Description	Measure Type	Project Cost ($)	Annual Cost Savings ($)	Electric Cost Savings ($)	Fuel Cost Savings ($)	Water Cost Savings ($)	Demand Savings (kW)	Energy Savings (kWh)	Fuel Savings (MBTUs)	Water Savings (Mgal)	Simple Payback (Years)	NYSERDA Incentive ($)	Revised Project Cost ($)	Revised Payback (Years)
1	L1	Upgrade T-12 Fixtures with New T-8 Lamps and Ballasts	Lighting	$2,798	$624	$949	-$325	$0	3.4	6,782	-14.2	0	4.5	$900	$1,898	3.0
2	L5	Install new LED Exit Signs	Lighting	$560	$52	$85	-$33	$0	0.1	608	-1.4	0	10.8	$70	$490	9.4
3	H6.3	Install High Efficiency HVAC System	HVAC	$9,000	$2,407	$2,407	$0	$0	30.0	8,265	0.0	0	3.7	$4,800	$4,200	1.7
4	C3	Install Programmable Thermostat	Controls	$4,000	$3,940	$0	$3,940	$0	0.0	0	172.4	0	1.0	$0	$4,000	1.0
5	B3	Install Inside Storm Windows	Envelope	$4,480	$1,016	$0	$1,016	$0	0.0	0	44.5	0	4.4	$0	$4,480	4.4
6	B4	Block Unnecessary Windows	Envelope	$5,400	$2,185	$0	$2,185	$0	0.0	0	95.6	0	2.5	$0	$5,400	2.5
7	B8	Install Attic Insulation	Envelope	$14,000	$3,091	$0	$3,091	$0	0.0	0	135.2	0	4.5	$0	$14,000	4.5
8	B13	Insulate Walls	Envelope	$37,431	$2,943	$0	$2,943	$0	0.0	0	128.8	0	12.7	$0	$37,431	12.7
9	W7	Install 7-Day Timer On Water Heater	Hot Water	$275	$146	$146	$0	$0	1.5	0	0.0	0	1.9	$0	$275	1.9
Project Totals				**$77,944**	**$16,404**	**$3,587**	**$12,817**	**$0**	**35.0**	**15,655**	**560.9**	**0**	**4.8**	**$5,770**	**$72,174**	**4.4**

Region #	Customer #	Utility Name	Measure Type	Fuel Type	Project Cost ($)	Annual Savings ($)	Electric Cost Savings ($)	Fuel Cost Savings ($)	Water Cost Savings ($)	Demand Savings (kW)	Energy Savings (kWh)	Fuel Savings (MBTUs)	Water Savings (Mgal)	Simple Payback (Years)	NYSERDA Incentive ($)	Revised Project Cost ($)	Revised Payback (Years)
2	1057	NYSEG	Lighting	OIL	$3,358	$676	$1,034	-$358	$0	3.5	7,390	-15.6	0	5.0	$970	$2,388	3.5
2	1057	NYSEG	HVAC	OIL	$9,000	$2,407	$2,407	$0	$0	30.0	8,265	0.0	0	3.7	$4,800	$4,200	1.7
2	1057	NYSEG	Controls	OIL	$4,000	$3,940	$0	$3,940	$0	0.0	0	172.4	0	1.0	$0	$4,000	1.0
2	1057	NYSEG	Envelope	OIL	$61,311	$9,235	$0	$9,235	$0	0.0	0	404.1	0	6.6	$0	$61,311	6.6
2	1057	NYSEG	Hot Water	OIL	$275	$146	$146	$0	$0	1.5	0	0.0	0	1.9	$0	$275	1.9
2	1057	NYSEG	Custom	OIL	$0	$0	$0	$0	$0	0.0	0	0.0	0		$0	$0	
2	1057	NYSEG	Kitchen	OIL	$0	$0	$0	$0	$0	0.0	0	0.0	0		$0	$0	
Project Totals					**$77,944**	**$16,404**	**$3,587**	**$12,817**	**$0**	**35.0**	**15,655**	**560.9**	**0**	**4.8**	**$5,770**	**$72,174**	**4.4**

A total of nine energy conservation measures have been recommended for implementation. They have an installed capital cost of $77,944 and an annual savings of $16,404 for a payback of 4.8 years. Incentives are available through the Existing Facilities Program totaling $5,770. These incentives will reduce the installed cost to $72,174 and the payback would be reduced to 4.4 years.

Annual Emissions Savings

Fuel Type		NOx (LBS)	SO2 (LBS)	CO2 (LBS)
Electricity		20	47	13,808
Natural Gas		0	0	0
Oil		8,897	1,779	90,389
Propane		0	0	0
Other:	Other Fuel Type Name	0	0	0
Total		8,918	1,827	104,197

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Figure 2 - Ten Year Cashflow Projection

Project Cost	$77,944	**Current Interest Rate**	8.5%
Final Project Cost	$77,944	**Net Interest**	8.5%
Annual Energy Cost Savings	$16,404		
Final Annual Energy Cost Savings	$16,404	**Utility Cost Annual Escalation**	3.0%

Year	1	2	3	4	5	6	7	8	9	10
Option 1										
No Loan										
Utility Cost Savings	$16,404.00	$16,896.12	$17,403.00	$17,925.09	$18,462.85	$19,016.73	$19,587.23	$20,174.85	$20,780.10	$21,403.50
Cash at Year End	-$61,540.00	-$44,643.88	-$27,240.88	-$9,315.78	$9,147.06	$28,163.80	$47,751.03	$67,925.88	$88,705.98	$110,109.48
Option 2										
Bank Loan										
Loan Payments	$14,088.38	$13,425.85	$12,763.33	$12,100.81	$11,438.28	$10,775.76	$10,113.23	$9,450.71	$8,788.19	$8,125.66
Loan Balance	$70,149.60	$62,355.20	$54,560.80	$46,766.40	$38,972.00	$31,177.60	$23,383.20	$15,588.80	$7,794.40	$0.00
Utility Cost Savings	$16,404.00	$16,896.12	$17,403.00	$17,925.09	$18,462.85	$19,016.73	$19,587.23	$20,174.85	$20,780.10	$21,403.50
Cash at Year End	$2,315.62	$5,785.89	$10,425.56	$16,249.85	$23,274.41	$31,515.39	$40,989.39	$51,713.53	$63,705.44	$76,983.28

The chart shows two examples of cash flow analysis for a ten year period. The cost of energy is escalated by 3.0% per year. In the first example, owner financing is used. In the second example, 10 year financing is used with an 8.5% interest loan.

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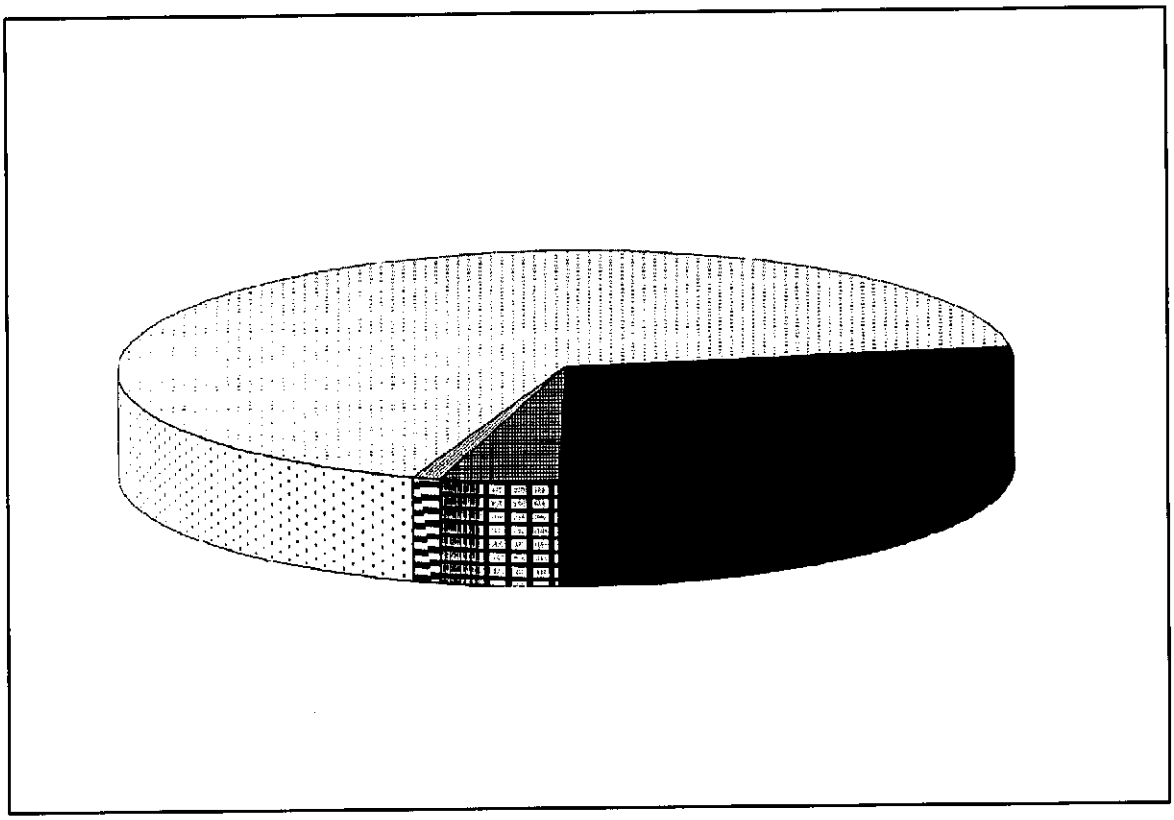
Annual Energy Consumption
(Electricity - kWh/Yr)



Legend		
	67.2%	Equipment
	27.5%	Lighting
	4.3%	AC
	1.0%	DHW

Figure 3

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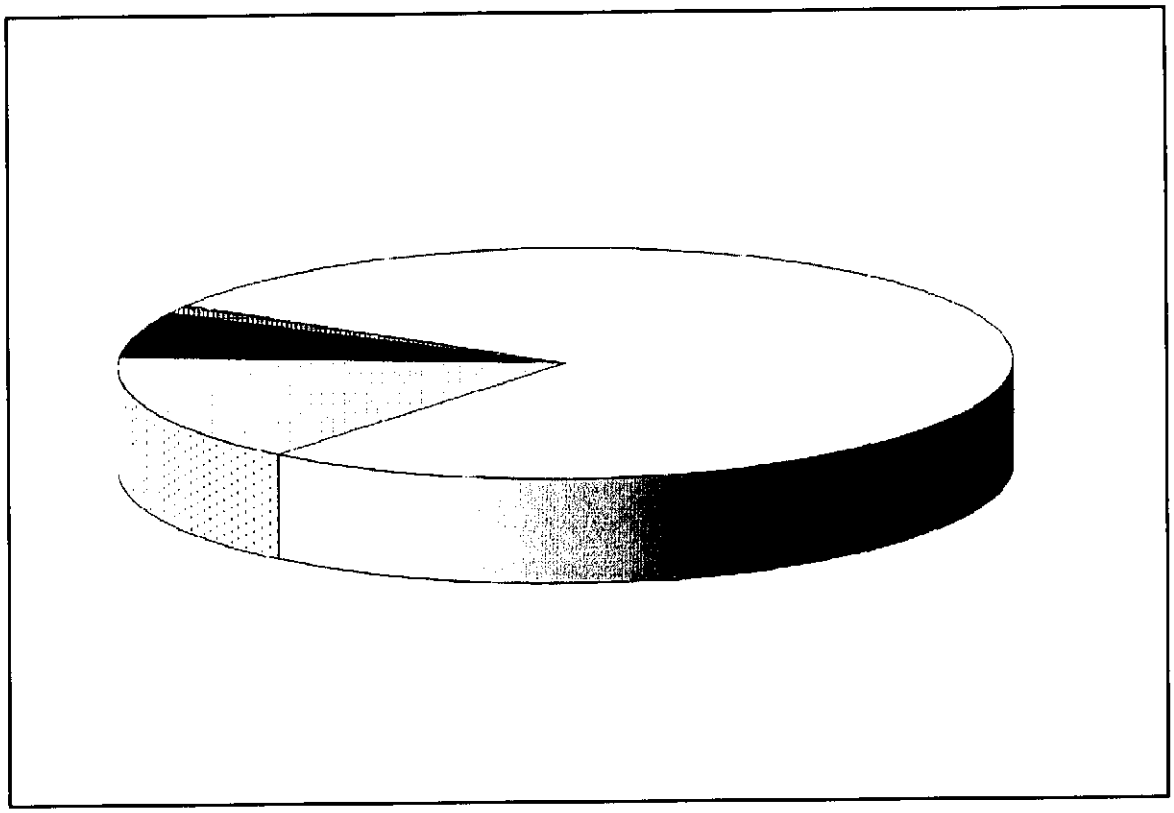
Annual Energy Cost
($/Yr)



Legend		
	15.3%	Equipment
	6.3%	Lighting
	1.0%	AC
	0.2%	DHW
	77.2%	Space Heating

Figure 4

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Figure 5

Equipment Inventory

Lighting

Area	Quantity	Fixture Desc	Watts/fixture	Annual Hours	Annual kWhs
First Floor Classrooms (6)	72	2F32T8	60	2,200	9,504
Second Flr Classrooms (7)	80	2F32T8	60	2,200	10,560
Principal's Office	2	4F34T12	156	2,200	686
1st Floor Office	3	4F34T12	156	2,200	1,030
Auditorium	4	12CF	216	2,200	1,901
Bathrooms (2)	4	1F32T8	32	2,200	282
Outer Bathroom (2)	2	2F34T12	78	2,200	343
1st Flr hallway	6	2F34T12	78	2,200	1,030
Hallway to Gym	1	2F34T12	78	2,200	172
Gymnasium	15	4F54T5HO	216	2,200	7,128
PE Office	4	2F34T12	78	2,200	686
Kitchen	4	2F34T12	78	2,200	686
Nurses Office	3	2F32T8	60	2,200	396
2nd Fl. Hallway	9	2F34T12	78	2,200	1,544
2nd Fl. Office	3	4F34T12	156	2,200	1,030
2nd Fl. Bathrooms (2)	4	4F34T12	156	2,200	1,373
2nd Fl. Office Bathroom	1	I60	60	2,200	132
Boiler Room	3	CF	23	480	33
Basement room	18	3F34T12	117	480	1,011
Exit lights	7	CFL	13	8,760	797 ?
Total	245				40,324

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Figure 5

Equipment Inventory

Heating

Unit	Quantity	Input btuh	Output mbtu/h	Annual gallons	Type
HB Smith 350 Mills Boiler	1		179		12 Section
HB Smith 350 Mills Boiler			139		10 Section
Total	1			22,003	

Cooling (HVAC)

Unit	Type	Quantity	Capacity Tons	Estimated EER	Consumption kWhs
Mitsubitsu	Split	2	2	10	6,240
Total		2			6,240

Water Heating (Electric)

Unit	Quantity	Input btu/h	Capacity Gallons	Standby kWh	Consumption kWh	Total kWh	Type
Weil	1		6		1,500	1,500	Electric
Total	1					1,500	

Water Heating (oil)

Unit	Quantity	Input btu/h	Capacity Gallons	Standby gallons	Consumption gallons	Total gallons	Type
AO Smith COF140-199	1	140,000	140				Oil fired
Total	1					0	

Windows

Area	Quantity	Type	Height (in)	Width (in)	Area (sq ft)	Action	
First Floor Classrooms (6)	42	Vinyl	72	30	630		
Second Flr Classrooms (7)	42	Vinyl	72	30	630		
Principal's Office	1	Vinyl	72	60	30		
Auditorium	4	Wood	120	48	160		
!st Flr hallway	3	Vinyl	48	48	48		
Hallway to Gym	3	Vinyl	60	48	60		
Gymnasium	7	Wood	60	96	280		
PE Office	2	Vinyl	72	48	48		
Kitchen	4	Vinyl	72	48	96		
Nurses Office	2	Vinyl	72	30	30		
2nd Fl. Hallway	3	Vinyl	48	48	48		
2nd Fl. Office	2	Vinyl	72	30	30		
2nd Fl. Bathrooms (2)	2	Vinyl	72	30	30		
2nd Fl. Office Bathroom	1	Vinyl	72	30	15		
Boiler Room	2	Metal`	24	36	12	?	
Basement room	4	Metal`	48	30	40	?	
					0		
Total	124				2,187		

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FIGURE 6 - HISTORICAL ELECTRIC BILLS

Utility Name: NYSEG
Account #: 1001-0127-263
Rate Class:

Start Billing Date	End Billing Date	Billing Days	Energy Usage (kWh)	Electric Energy Costs ($)	Maximum Demand Usage (kW)	Demand Cost ($)	Total Energy Cost ($)	Average Energy Cost ($/kWh)
05/06/2008	06/06/2008	31	12,580				$1,874.00	$0.15
06/07/2008	07/07/2008	31	11,600				$1,790.00	$0.15
07/08/2008	08/06/2008	30	8,880				$1,892.00	$0.21
08/07/2008	09/05/2008	30	8,680				$2,071.00	$0.24
09/06/2008	10/06/2008	31	13,680				$1,864.00	$0.14
10/07/2008	11/05/2008	30	13,400				$2,802.00	$0.21
11/06/2008	12/08/2008	33	14,520				$2,926.00	$0.20
12/09/2008	01/07/2009	30	10,820				$1,137.00	$0.11
01/08/2009	02/05/2009	29	13,280				$1,417.00	$0.11
02/06/2009	03/06/2009	29	12,720				$1,050.00	$0.08
03/07/2009	04/06/2009	31	13,600				$969.00	$0.07
04/07/2009	05/05/2009	29	12,560				$834.00	$0.07
Total		364	146,320	$0.00			$20,626.00	
Annualized		365	146,722	$0.00			$20,682.66	
Average Energy Cost ($/kWh)				$0.00			$0.14	
Demand Cost ($/kW)		Maximum	$0.00	Average		Minimum	$0.00	

NYSEG supplies electricity. Annualized electricity cost for the billing period was $20,683 for 146,722 kWh and a unit cost of $0.14 per kWh.

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FIGURE 7 - HISTORICAL OIL HEATING BILLS

Utility Name: _____

Account #: _____

Rate Class: _____

Start Billing Date	End Billing Date	Billing Days	Oil Usage (Gallons)	Oil Cost ($)	Average Cost ($/Gallon)
06/03/2007	10/04/2007	123	1,500	$3,464.00	$2.31
10/05/2007	12/05/2007	62	3,000	$8,216.00	$2.74
12/06/2007	01/03/2008	29	3,000	$8,949.00	$2.98
01/04/2008	02/01/2008	29	2,500	$6,810.00	$2.72
02/02/2008	03/05/2008	33	3,000	$9,080.00	$3.03
03/06/2008	03/15/2008	10	5,000	$17,108.00	$3.42
03/16/2008	05/29/2008	75	4,003	$16,046.00	$4.01
Total		361	22,003	$69,673.00	
Average Cost per Gallon				$3.17	

0.0 provides oil for space heating. Oil usage was 22,003 gallons with an average unit cost of $3.17 per gallon for an annual cost of $69,673.

Section 1

EXISTING CONDITIONS

1.1 BUILDING ENVELOPE

The Town of Amenia Town Hall is located at 4900 Route 22 in Amenia, NY 12501. Total floor area is about 25,000 square feet. This 1920 brick building has two stories with a flat roof and a basement. Windows are mostly double glazed. The building was a school and is being converted to Town offices.

1.2 HEATING AND COOLING SYSTEMS

The heat is hydronic and is produced by two oil fired boilers located in the basement. The building's offices are cooled by Mitsubti air conditioners.

1.3 LIGHTING SYSTEMS

The majority of the lighting consists of linear fluorescent, with an equal number of newer T-8 bulbs and older T12's. The gymnasium has T-5 fluorescents.

1.4 WATER HEATING SYSTEMS

Domestic hot water is produced by a 140 gallon AO Smith oil fired hot water tank and small electric hot water tank in the gymnasium.

Section 2

ENERGY CONSERVATION MEASURES (ECMs)

NYSERDA

Town of Amenia Town Hall

ECM SUMMARY SHEET

ECM NUMBER:	1	
ECM CODE:	L1	
ECM DESCRIPTION:	Upgrade T-12 Fixtures with New T-8 Lamps and Ballasts	
PROJECT COST:	$2,798	
SIMPLE PAYBACK:	4.5	Years
ELECTRICAL ENERGY SAVINGS:	6,782	kWh/Year
DEMAND SAVINGS:	3.4	kW/Month
OTHER FUEL SAVINGS:	-14.2	Mbtu/Year
WATER SAVINGS:	0	Mgal/Year
ANNUAL ENERGY COST SAVINGS:	$624	

EXISTING CONDITIONS:

Some of the building lighting consists of standard T-12 fluorescent lamps with T-12 magnetic ballasts. T-8 fluorescent lighting with electronic ballasts use less energy than magnetic ballasts and do not flicker. A standard two tube T-12 fixture with two 34 watt tubes consumes about 74 watts. Converting to 1" diameter T-8 lamps with a high performance electronic ballast reduces the power consumption to 52 watts. Light output is increased as well as lamp and ballast life. Typically, one ballast is used for every two lamps but one ballast can run combinations of lamps from one to four. T-8 lighting can be used in 2', 3', 4', 8' and U-tube fixtures.

ECM SPECIFICATIONS:

Replace the existing T-12 lamps and magnetic ballasts with T-8 lamps and ballasts using the existing fixtures. Refer to the calculation sheet in Appendix B for locations and the cost estimates in Appendix A for the quantities of lamps and ballasts to replace. Financial incentives are available from NYSERDA if the proposed fixture type meets eligibilty requirements. This measure is eligible for an incentive of $900 through the Existing Facilities Program. Existing T-8 fixtures can be updated on an attrtion basis. Only the T-12'S were considered in the calculations.

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ECM SUMMARY SHEET

ECM NUMBER:	2	
ECM CODE:	L5	
ECM DESCRIPTION:	Install new LED Exit Signs	
PROJECT COST:	$560	
SIMPLE PAYBACK:	10.8	Years
ELECTRICAL ENERGY SAVINGS:	608	kWh/Year
DEMAND SAVINGS:	0.1	kW/Month
OTHER FUEL SAVINGS:	-1.4	Mbtu/Year
WATER SAVINGS:	0	Mgal/Year
ANNUAL ENERGY COST SAVINGS:	$52	

EXISTING CONDITIONS:

The existing exit signs are lit with two incandescent lamps. The lamps are usually 15 watts each. While the total fixture wattage is not large, they are on at all times. Additionally, the incandescent lamps burn out often and must be replaced on a regular basis to maintain safety.

ECM SPECIFICATIONS:

Replace the exit signs with LED exit signs equipped with battery backup. The LED lamps draw only 4 watts each, and can last up to 25 years. Savings are based upon replacing 7 exit signs. Financial incentives are available from NYSERDA if the proposed fixture type meets eligibilty requirements. Retrofit kits are not eligible for incentives. This measure is eligible for an incentive of $70 through the Existing Facilities Program.

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ECM SUMMARY SHEET

ECM NUMBER:	3	
ECM CODE:	H6.3	
ECM DESCRIPTION:	Install High Efficiency HVAC System	
PROJECT COST:	$9,000	
SIMPLE PAYBACK:	3.7	Years
ELECTRICAL ENERGY SAVINGS:	8,265	kWh/Year
DEMAND SAVINGS:	30.0	kW/Month
OTHER FUEL SAVINGS:	0.0	Mbtu/Year
WATER SAVINGS:	0	Mgal/Year
ANNUAL ENERGY COST SAVINGS:	$2,407	

EXISTING CONDITIONS:

New cooling equipment is about to be installed in the new offices. Use efficient equipment of at least EER 12 (1 KW per ton).

ECM SPECIFICATIONS:

The savings calculation shows cooling savings comparing new high efficiency air conditioning equipment compared to standard efficiency equipment (EER 12 versus EER 8). The cost estimate used in the payback calculation is based on the cost premium paid for high efficiency equipment versus standard efficiency equipment. Financial incentives are available from NYSERDA if the proposed equipment type meets eligibilty requirements. This measure is eligible for an incentive of $4,800 through the Existing Facilities Program ($80 per ton for an estimated 60 tons total if the majority of the building is to be airconditioned).

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ECM SUMMARY SHEET

ECM NUMBER:	4	
ECM CODE:	C3	
ECM DESCRIPTION:	Install Programmable Thermostat	
PROJECT COST:	$4,000	
SIMPLE PAYBACK:	1.0	Years
ELECTRICAL ENERGY SAVINGS:	0	kWh/Year
DEMAND SAVINGS:	0.0	kW/Month
OTHER FUEL SAVINGS:	172.4	Mbtu/Year
WATER SAVINGS:	0	Mgal/Year
ANNUAL ENERGY COST SAVINGS:	$3,940	

EXISTING CONDITIONS:

One of the best ways to save energy is to reduce the temperature of the building during the heating season, and raise it in the cooling season, when no one is present.

ECM SPECIFICATIONS:

Install a programmable thermostat system for the entire building. Program the thermostats to return to normal temperature an hour or so before occupants return in the morning. A thermostat with a battery backup is useful because the programming will not be lost if there is a power outage. Also, if occupants are occasionally in the building after hours, many programmable thermostats have a button that provides a three hour override to the temperature setback.

NYSERDA

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ECM SUMMARY SHEET

ECM NUMBER:	5	
ECM CODE:	B3	
ECM DESCRIPTION:	Install Inside Storm Windows	
PROJECT COST:	$4,480	
SIMPLE PAYBACK:	4.4	Years
ELECTRICAL ENERGY SAVINGS:	0	kWh/Year
DEMAND SAVINGS:	0.0	kW/Month
OTHER FUEL SAVINGS:	44.5	Mbtu/Year
WATER SAVINGS:	0	Mgal/Year
ANNUAL ENERGY COST SAVINGS:	$1,016	

EXISTING CONDITIONS:

The existing windows are single glazed. While it is not cost effective to replace them, energy can be saved by installing temporary interior storm windows to reduce energy loss from both conduction and infiltration in winter. Interior storm windows can be made from plexiglass or plate glass. Plexiglass windows will be less costly to install but glass windows will have a longer life and usually have a more pleasing appearance than plexiglass.

ECM SPECIFICATIONS:

Install interior glass storm windows for the gym. There is approximately 280 square feet of window to cover.

NYSERDA

Town of Amenia Town Hall

ECM SUMMARY SHEET

ECM NUMBER:	6	
ECM CODE:	B4	
ECM DESCRIPTION:	Block Unnecessary Windows	
PROJECT COST:	$5,400	
SIMPLE PAYBACK:	2.5	Years
ELECTRICAL ENERGY SAVINGS:	0	kWh/Year
DEMAND SAVINGS:	0.0	kW/Month
OTHER FUEL SAVINGS:	95.6	Mbtu/Year
WATER SAVINGS:	0	Mgal/Year
ANNUAL ENERGY COST SAVINGS:	$2,185	

EXISTING CONDITIONS:

Large glass areas can be reduced by removing the glass and filling in the opening with insulated walls. Large glass areas waste energy through both conduction and infiltration. Comfort is also reduced near the windows which may use occupants to increase the thermostat setting.

ECM SPECIFICATIONS:

Remove the existing windows and block the opening to match the exterior of the building. Install batt insulation and finish the interior with sheetrock. The savings was calculated based on reducing window area by 450 square feet or about 20 percent of the existing window area.

NYSERDA

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ECM SUMMARY SHEET

ECM NUMBER:	7	
ECM CODE:	B8	
ECM DESCRIPTION:	Install Attic Insulation	
PROJECT COST:	$14,000	
SIMPLE PAYBACK:	4.5	Years
ELECTRICAL ENERGY SAVINGS:	0	kWh/Year
DEMAND SAVINGS:	0.0	kW/Month
OTHER FUEL SAVINGS:	135.2	Mbtu/Year
WATER SAVINGS:	0	Mgal/Year
ANNUAL ENERGY COST SAVINGS:	$3,091	

EXISTING CONDITIONS:

The existing attic insulation is not at the recommended level of R-38. The lack of insulation permits excessive heat loss in the winter and excessive heat gain in the summer.

ECM SPECIFICATIONS:

Increase the R-value of the ceiling by adding sufficient insulation levels to reach R-29. This can be done by adding fiberglass batt insulation above the dropped ceiling, Never place insulation over light fixtures. The calculation is based on insulating 10,000 square feet.

NYSERDA

Town of Amenia Town Hall

ECM SUMMARY SHEET

ECM NUMBER:	8	
ECM CODE:	B13	
ECM DESCRIPTION:	Insulate Walls	
PROJECT COST:	$37,431	
SIMPLE PAYBACK:	12.7	Years
ELECTRICAL ENERGY SAVINGS:	0	kWh/Year
DEMAND SAVINGS:	0.0	kW/Month
OTHER FUEL SAVINGS:	128.8	Mbtu/Year
WATER SAVINGS:	0	Mgal/Year
ANNUAL ENERGY COST SAVINGS:	$2,943	

EXISTING CONDITIONS:

The historic brick facade cannot be changed so interior insulation is required.

ECM SPECIFICATIONS:

Insulate approximately 12,477 square feet of interior wall area with fiberglass insulation coved with sheetrock.

Town of Amenia Town Hall

ECM SUMMARY SHEET

ECM NUMBER:	9	
ECM CODE:	W7	
ECM DESCRIPTION:	Install 7-Day Timer On Water Heater	
PROJECT COST:	$275	
SIMPLE PAYBACK:	1.9	Years
ELECTRICAL ENERGY SAVINGS:	0	kWh/Year
DEMAND SAVINGS:	1.5	kW/Month
OTHER FUEL SAVINGS:	0.0	Mbtu/Year
WATER SAVINGS:	0	Mgal/Year
ANNUAL ENERGY COST SAVINGS:	$146	

EXISTING CONDITIONS:

The existing electric resistance water heater is on continually although the building is only occupied for a few hours per week. Electricity is wasted in keeping the water in the tank warm.

ECM SPECIFICATIONS:

Install a 7-day timer on the electric water heater. Energize the water heater 2 hours before occupants are scheduled to arrive at the building. The timer should have a battery backup

Appendix A

COST ESTIMATES

L&S ENERGY SERVICES, INC.

Project Name: Town of Amenia Town Hall
Project No.: NYSERDA Contract #9849
Calculated by:
Checked by:

Sheet No: 1 of 1
Date: July 21, 2009
Date: July 21, 2009

ECM #: 1
ECM Code: L1
ECM Description: Upgrade T-12 Fixtures with New T-8 Lamps and Ballasts

Div.	Description	Qty.	Unit	Unit Labor	Cost Material	Total Labor	Total Material	Total	Ref.
	1 lamp electronic ballast 2'	0	ea	$20.00	$20.00	$0.00	$0.00	$0.00	
	1 lamp electronic ballast 4'	4	ea	$20.00	$16.49	$80.00	$65.96	$145.96	
	2 lamp electronic ballast 4'	26	ea	$20.00	$16.49	$520.00	$428.74	$948.74	
	3 lamp electronic ballast 4'	18	ea	$20.00	$19.99	$360.00	$359.82	$719.82	
	4 lamp electronic ballast 4'	12	ea	$20.00	$19.99	$240.00	$239.88	$479.88	
	1 lamp electronic ballast 8'	0	ea	$20.00	$31.00	$0.00	$0.00	$0.00	
	2 lamp electronic ballast 8'	0	ea	$20.00	$33.00	$0.00	$0.00	$0.00	
	28 watt T-8 4' Lamps	158	ea	$0.00	$3.19	$0.00	$504.02	$504.02	
	60 watt T-8 8' Lamps	0	ea	$0.00	$8.50	$0.00	$0.00	$0.00	
	18 watt T-8 2' Lamps	0	ea	$0.00	$5.50	$0.00	$0.00	$0.00	
	Subtotal					$1,200.00	$1,598.42	$2,798.42	
	City Factor 100.0%							$2,798.42	
	Contingency 0%							$0.00	
	Design Services 0%							$0.00	
	Contractor OH + GA 0%							$0.00	
	Contractor profit 0%							$0.00	
	Total							$2,798.42	
	Round-Up Total							$2,798.42	

The costs noted above are estimates only and may be modified by changing conditions or the passage of time.

L&S ENERGY SERVICES, INC.

Project Name: **Town of Amenia Town Hall**
Project No.: NYSERDA Contract #9849
Calculated by:
Checked by:

Sheet No: 1 of 1
Date: July 21, 2009
Date: July 21, 2009

ECM #: 2
ECM Code: L5
ECM Description: Install new LED Exit Signs

Div.	Description	Qty.	Unit	Unit Labor	Cost Material	Total Labor	Total Material	Total	Ref.
	install 4 watt LED Exit Sign	7	ea	$15.00	$65.00	$105.00	$455.00	$560.00	
	Subtotal					$105.00	$455.00	$560.00	
	City Factor 100.0%							$560.00	
	Contingency 0%							$0.00	
	Design Services 0%							$0.00	
	Contractor OH + GA 0%							$0.00	
	Contractor profit 0%							$0.00	
	Total							$560.00	
	Round-Up Total							$560.00	

The costs noted above are estimates only and may be modified by changing conditions or the passage of time.

L&S ENERGY SERVICES, INC.

Project Name: **Town of Amenia Town Hall**
Project No.: NYSERDA Contract #9849
Calculated by:
Checked by:

Sheet No: 1 of 1
Date: July 21, 2009
Date: July 21, 2009

ECM #: 3
ECM Code: H6.3
ECM Description: Install High Efficiency HVAC System

Div.	Description	Qty.	Unit	Unit Labor	Cost Material	Total Labor	Total Material	Total	Ref.
	Install high efficiency AC when installing new equipment	60	tons	$0.00	$150.00	$0.00	$9,000.00	$9,000.00	
	(cost based on estimate price premium over standard								
	efficiency)								
	Subtotal					$0.00	$9,000.00	$9,000.00	
	City Factor 100.0%							$9,000.00	
	Contingency 0%							$0.00	
	Design Services 0%							$0.00	
	Contractor OH + GA 0%							$0.00	
	Contractor profit 0%							$0.00	
	Total							$9,000.00	
	Round-Up Total							$9,000.00	

The costs noted above are estimates only and may be modified by changing conditions or the passage of time.

L&S ENERGY SERVICES, INC.

Project Name: **Town of Amenia Town Hall**
Project No.: NYSERDA Contract #9849
Calculated by:
Checked by:

Sheet No: 1 of 1
Date: July 21, 2009
Date: July 21, 2009

ECM #: 4
ECM Code: C3
ECM Description: Install Programmable Thermostat

Div.	Description	Qty.	Unit	Unit Labor	Cost Material	Total Labor	Total Material	Total	Ref.
	install programmable thermostat system for new offices	1	ea	$1,500.00	$2,500.00	$1,500.00	$2,500.00	$4,000.00	
	Subtotal					$1,500.00	$2,500.00	$4,000.00	
	City Factor 100.0%							$4,000.00	
	Contingency 0%							$0.00	
	Design Services 0%							$0.00	
	Contractor OH + GA 0%							$0.00	
	Contractor profit 0%							$0.00	
	Total							$4,000.00	
	Round-Up Total							$4,000.00	

The costs noted above are estimates only and may be modified by changing conditions or the passage of time.

L&S ENERGY SERVICES, INC.

Project Name: **Town of Amenia Town Hall**
Project No.: NYSERDA Contract #9849
Calculated by:
Checked by:

Sheet No: 1 of 1
Date: July 21, 2009
Date: July 21, 2009

ECM #: 5
ECM Code: B3
ECM Description: Install Inside Storm Windows

Div.	Description	Qty.	Unit	Unit Labor	Cost Material	Total Labor	Total Material	Total	Ref.
	install interior storms for gym windows	280	sf	$6.00	$10.00	$1,680.00	$2,800.00	$4,480.00	
	Subtotal					$1,680.00	$2,800.00	$4,480.00	
	City Factor 100.0%							$4,480.00	
	Contingency 0%							$0.00	
	Design Services 0%							$0.00	
	Contractor OH + GA 0%							$0.00	
	Contractor profit 0%							$0.00	
	Total							$4,480.00	
	Round-Up Total							$4,480.00	

The costs noted above are estimates only and may be modified by changing conditions or the passage of time.

L&S ENERGY SERVICES, INC.

Project Name: **Town of Amenia Town Hall**
Project No.: NYSERDA Contract #9849
Calculated by:
Checked by:

Sheet No: 1 of 1
Date: July 21, 2009
Date: July 21, 2009

ECM #: 6
ECM Code: B4
ECM Description: Block Unnecessary Windows

Div.	Description	Qty.	Unit	Unit Labor	Cost Material	Total Labor	Total Material	Total	Ref.
	reduce glass area and infill with insulated construction	450	sf	$6.00	$6.00	$2,700.00	$2,700.00	$5,400.00	
	Subtotal					$2,700.00	$2,700.00	$5,400.00	
	City Factor 100.0%							$5,400.00	
	Contingency 0%							$0.00	
	Design Services 0%							$0.00	
	Contractor OH + GA 0%							$0.00	
	Contractor profit 0%							$0.00	
	Total							$5,400.00	
	Round-Up Total							$5,400.00	

The costs noted above are estimates only and may be modified by changing conditions or the passage of time.

L&S ENERGY SERVICES, INC.

Project Name: **Town of Amenia Town Hall**
Project No.: NYSERDA Contract #9849
Calculated by:
Checked by:

Sheet No: 1 of 1
Date: July 21, 2009
Date: July 21, 2009

ECM #: 7
ECM Code: B8
ECM Description: Install Attic Insulation

Div.	Description	Qty.	Unit	Unit Labor	Cost Material	Total Labor	Total Material	Total	Ref.
	insulate ceiling with fiberglass insulation	10,000	sf	$0.65	$0.75	$6,500.00	$7,500.00	$14,000.00	
	Subtotal					$6,500.00	$7,500.00	$14,000.00	
	City Factor 100.0%							$14,000.00	
	Contingency 0%							$0.00	
	Design Services 0%							$0.00	
	Contractor OH + GA 0%							$0.00	
	Contractor profit 0%							$0.00	
	Total							$14,000.00	
	Round-Up Total							$14,000.00	

The costs noted above are estimates only and may be modified by changing conditions or the passage of time.

L&S ENERGY SERVICES, INC.

Project Name: **Town of Amenia Town Hall**
Project No.: NYSERDA Contract #9849
Calculated by:
Checked by:

Sheet No: 1 of 1
Date: July 21, 2009
Date: July 21, 2009

ECM #: 8
ECM Code: BI3
ECM Description: Insulate Walls

Div.	Description	Qty.	Unit	Unit Labor	Cost Material	Total Labor	Total Material	Total	Ref.
	insulate walls on the inside and cover with sheetrock	12,477	sf	$1.50	$1.50	$18,715.50	$18,715.50	$37,431.00	
	Subtotal					$18,715.50	$18,715.50	$37,431.00	
	City Factor 100.0%							$37,431.00	
	Contingency 0%							$0.00	
	Design Services 0%							$0.00	
	Contractor OH + GA 0%							$0.00	
	Contractor profit 0%							$0.00	
	Total							$37,431.00	
	Round-Up Total							$37,431.00	

The costs noted above are estimates only and may be modified by changing conditions or the passage of time.

L&S ENERGY SERVICES, INC.

Project Name: **Town of Amenia Town Hall**
Project No.: NYSERDA Contract #9849
Calculated by:
Checked by:

Sheet No: 1 of 1
Date: July 21, 2009
Date: July 21, 2009

ECM #: 9
ECM Code: W7
ECM Description: Install 7-Day Timer On Water Heater

Div.	Description	Qty.	Unit	Unit Labor	Cost Material	Total Labor	Total Material	Total	Ref.
	install timer on electric water heater	1	ea	$100.00	$175.00	$100.00	$175.00	$275.00	
	Subtotal					$100.00	$175.00	$275.00	
	City Factor 100.0%							$275.00	
	Contingency 0%							$0.00	
	Design Services 0%							$0.00	
	Contractor OH + GA 0%							$0.00	
	Contractor profit 0%							$0.00	
	Total							$275.00	
	Round-Up Total							$275.00	

The costs noted above are estimates only and may be modified by changing conditions or the passage of time.

Appendix B

CALCULATIONS

Town of Amenia Town Hall

PARMETERS		
80%	Percent	Heating System Efficiency
138,690	BTU/gallons	Heating Fuel Type Conversion Factor
3.0	COP	Cooling COP
3,413	BTU/kWh	Cooling Fuel Type Conversion Factor

ECM DESCRIPTION: ECM 1 L1 - Upgrade T-12 Fluorescent with High Performance T-8

ECM FIXTURE DETAILS

		PRE-RETROFIT CONDITIONS					POST-RETROFIT CONDITIONS					LIGHTING KWH SAVINGS			KW SAVINGS		COST SAVINGS ($)					Non-Elec. Heating Fuel Svgs	Non-Elec. Clg Fuel Svgs
ECM Number	Location	Fixt. Qnty	Fixture Description	Watts per Fixture	Installed Watts	Annual Operating Hours	Fixt. Qnty	Fixture Description	Watts per Fixture	Installed Watts	Annual Operating Hours	All Periods	Occuring in Heating Mode Only	Occuring in Cooling Mode Only	Installed Lighting	Lighting On-Peak	Demand	Lighting Energy	Heating (Penalty)	Cooling (Credit)	Total	MBTU	MBTU
ECM1	First Floor Classrooms (6)	72	2F32T8	60	4,320	2,200	72	2F28T8	52	3,744	2,200	1,267	688	388	0.58	0.58	-	177	(67)	18.1	128	(2.9)	-
ECM1	Second Flr Classrooms (7)	80	2F32T8	60	4,800	2,200	80	2F28T8	52	4,160	2,200	1,408	764	431	0.64	0.64	-	197	(75)	20.1	143	(3.3)	-
ECM1	Principal's Office	2	4F34T12	156	312	2,200	2	4F28T8	98	196	2,200	255	138	78	0.12	0.12	-	36	(14)	3.6	26	(0.6)	-
ECM1	1st Floor Office	3	4F34T12	156	468	2,200	3	4F28T8	98	294	2,200	383	208	117	0.17	0.17	-	54	(20)	5.5	39	(0.9)	-
ECM1	Bathrooms (2)	4	1F32T8	32	128	2,200	4	1F28T8	26	104	2,200	53	29	16	0.02	0.02	-	7	(3)	0.8	5	(0.1)	-
ECM1	Outer Bathroom (2)	2	2F34T12	78	156	2,200	2	2F28T8	52	104	2,200	114	62	35	0.05	0.05	-	16	(6)	1.6	12	(0.3)	-
ECM1	1st Flr hallway	6	2F34T12	78	468	2,200	6	2F28T8	52	312	2,200	343	186	105	0.16	0.16	-	48	(18)	4.9	35	(0.8)	-
ECM1	Hallway to Gym	1	2F34T12	78	78	2,200	1	2F28T8	52	52	2,200	57	31	18	0.03	0.03	-	8	(3)	0.8	6	(0.1)	-
ECM1	PE Office	4	2F34T12	78	312	2,200	4	2F28T8	52	208	2,200	229	124	70	0.10	0.10	-	32	(12)	3.3	23	(0.5)	-
ECM1	Kitchen	4	2F34T12	78	312	2,200	4	2F28T8	52	208	2,200	229	124	70	0.10	0.10	-	32	(12)	3.3	23	(0.5)	-
ECM1	Nurses Office	3	2F32T8	60	180	2,200	3	2F28T8	52	156	2,200	53	29	16	0.02	0.02	-	7	(3)	0.8	5	(0.1)	-
ECM1	2nd Fl. Hallway	9	2F34T12	78	702	2,200	9	2F28T8	52	468	2,200	515	279	158	0.23	0.23	-	72	(27)	7.4	52	(1.2)	-
ECM1	2nd Fl. Office	3	4F34T12	156	468	2,200	3	4F28T8	98	294	2,200	383	208	117	0.17	0.17	-	54	(20)	5.5	39	(0.9)	-
ECM1	2nd Fl. Bathrooms (2)	4	4F34T12	156	624	2,200	4	4F28T8	98	392	2,200	510	277	156	0.23	0.23	-	71	(27)	7.3	52	(1.2)	-
ECM1	Basement room	18	3F34T12	117	2,106	480	18	3F28T8	76	1,368	480	354	188	112	0.74	0.74	-	50	(18)	5.2	36	(0.8)	-

ECM SUBTOTALS

	KWH SAVINGS				KW SAVINGS		COST SAVINGS ($)					Non-Elec. Heating Fuel Svgs	Non-Elec. Clg Fuel Svgs
ECM Number	Lighting	Heating (Penalty)	Cooling (Credit)	Total	Installed Lighting	On-Peak	Demand	Lighting Energy	Heating (Penalty)	Cooling (Credit)	Total	MBTU	MBTU
ECM1	6,153	-	629	6,782	3.37	3.37	-	861	(325)	88	624	(14.2)	-
Grand Total	6,153	-	629	6,782	3.37	3.37	-	861	(325)	88	624	(14.2)	-

Town of Amenia Town Hall

PARMETERS		
80%	Percent	Heating System Efficiency
138,690	BTU/gallons	Heating Fuel Type Conversion Factor
3.0	COP	Cooling COP
3,413	BTU/kWh	Cooling Fuel Type Conversion Factor

ECM DESCRIPTION: ECM 2 L5 - Install LED Exit Signs

ECM FIXTURE DETAILS

		PRE-RETROFIT CONDITIONS					POST-RETROFIT CONDITIONS					LIGHTING KWH SAVINGS			KW SAVINGS		COST SAVINGS ($)					Non-Elec. Heating Fuel Svgs MBTU	Non-Elec. Clg Fuel Svgs MBTU
ECM Number	Location	Fixt. Qnty	Fixture Description	Watts per Fixture	Installed Watts	Annual Operating Hours	Fixt. Qnty	Fixture Description	Watts per Fixture	Installed Watts	Annual Operating Hours	All Periods	Occuring in Heating Mode Only	Occuring in Cooling Mode Only	Installed Lighting	Lighting On-Peak	Demand	Lighting Energy	Heating (Penalty)	Cooling (Credit)	Total		
ECM2	exits	7	1cfl	13	91	8,760	7	2led2	4	27	8,760	564	336	131	0.06	0.06	-	79	(33)	6.1	52	(1.4)	-

ECM SUBTOTALS

	KWH SAVINGS				KW SAVINGS		COST SAVINGS ($)					Non-Elec. Heating Fuel Svgs MBTU	Non-Elec. Clg Fuel Svgs MBTU
ECM Number	Lighting	Heating (Penalty)	Cooling (Credit)	Total	Installed Lighting	On-Peak	Demand	Lighting Energy	Heating (Penalty)	Cooling (Credit)	Total		
ECM2	564	-	44	608	0.06	0.06	-	79	(33)	6	52	(1.4)	-
Grand Total	564	-	44	608	0.06	0.06	-	79	(33)	6	52	(1.4)	-

Town of Amenia Town Hall
ECM Number: 3
ECM Description: H6.3 Install New High Efficiency AC by Attrition

Existing	Proposed	Parameters
1.50	1	KW/TON
65		Cooling Required Above This Outside Air Temperature (F)
60		Cooling Capacity (tons)
8.3200		Demand Savings ($/kW-Mo)
0.11000		Fuel Cost ($/Fuel Unit)
kWh		Fuel Unit
3,413		Fuel Conversion Factor (BTU/Fuel Unit)

Bin Temp (F)	Annual Hours	Part Load Multiplier	Equivalent Full Load Hours	Installed Capacity (tons)	KW/TON		Annual Energy Savings (kWh)
					Existing (kW/ton)	Proposed (kW/ton)	
A	B	C	D	E	F	G	H
			B * C				D*E*(F-G)
12.5	-	-	-	-	-	-	-
17.5	-	-	-	-	-	-	-
22.5	-	-	-	-	-	-	-
27.5	-	-	-	-	-	-	-
32.5	-	-	-	-	-	-	-
37.5	-	-	-	-	-	-	-
42.5	-	-	-	-	-	-	-
47.5	-	-	-	-	-	-	-
52.5	-	-	-	-	-	-	-
57.5	-	-	-	-	-	-	-
62.5	-	-	-	-	-	-	-
67.5	178	0.139	24.7	60.00	1.500	1.000	742
72.5	192	0.217	41.7	60.00	1.500	1.000	1,250
77.5	263	0.295	77.6	60.00	1.500	1.000	2,328
82.5	240	0.373	89.5	60.00	1.500	1.000	2,686
87.5	80	0.452	36.2	60.00	1.500	1.000	1,085
92.5	11	0.530	5.8	60.00	1.500	1.000	175
97.5	-	-	-	-	-	-	-
102.5	-	-	-	-	-	-	-
TOTAL	964		276		1.500	1.000	8,265

ANNUAL ENERGY SAVINGS

= 8,265 kWh

= 8,265 kWh * (0.11 $/kWh)
= $ 909

ANNUAL DEMAND SAVINGS

= 60 tons * (1.5 kW - 1 kW) = 30.00 kW
= 30.00 kW * $8.32 /kW * 6 Months
= $ 1,498

ANNUAL ENERGY SAVINGS

= $ 2,407

Facility: Town of Amenia Town Hall

ECM: ECM 4 C3 - Install Programmable Thermostats

Baseline **Schedule**	Occupied				Unoccupied			
Bin Temp	Hours	Part Load	Part Load Efficiency	Usage Factor	Htg Avail Hours	Part Load	Part Load Efficiency	Usage Factor
A	B	C	D	E	F	G	H	I
				EffxBxC/D				EffxFxG/H
-32.5	0	1.0	80.00%	0.0	0	1.0	80.00%	0.0
-27.5	0	1.0	80.00%	0.0	0	1.0	80.00%	0.0
-22.5	0	1.0	80.00%	0.0	0	1.0	80.00%	0.0
-17.5	0	1.0	80.00%	0.0	0	1.0	80.00%	0.0
-12.5	0	1.0	80.00%	0.0	0	1.0	80.00%	0.0
-7.5	0	1.0	80.00%	0.0	2	1.0	80.00%	2.5
-2.5	9	1.0	80.00%	11.3	13	1.0	80.00%	16.3
2.5	28	1.0	76.94%	34.7	31	1.0	76.94%	38.5
7.5	49	0.9	70.74%	59.8	57	0.9	70.74%	69.6
12.5	84	0.8	64.43%	100.7	92	0.8	64.43%	110.3
17.5	201	0.7	58.03%	236.2	241	0.7	58.03%	283.2
22.5	312	0.6	51.51%	357.9	219	0.6	51.51%	251.2
27.5	300	0.5	44.89%	334.1	271	0.5	44.89%	301.8
32.5	395	0.4	38.17%	423.4	377	0.4	38.17%	404.1
37.5	454	0.3	31.34%	461.0	420	0.3	31.34%	426.4
42.5	388	0.2	24.40%	361.4	253	0.2	24.40%	235.6
47.5	234	0.1	17.36%	183.8	221	0.1	17.36%	173.6
52.5	300	0.0	10.22%	133.4	261	0.0	10.22%	116.1
57.5	0	0.0	0.00%	0.0	0	0.0	0.00%	0.0
62.5	0	0.0	0.00%	0.0	0	0.0	0.00%	0.0
67.5	0	0.0	0.00%	0.0	0	0.0	0.00%	0.0
Totals	2754			**2697.7**	2458			**2429.2**
Annual Total Usage Factor								**5126.9**

Baseline

	Temp	% Load
Min	0	1
Bal Point	55	0
Full Load Efficiency:		0.8
UnOcc Setback F		0

DOE Curve

X^2	X	B
-0.07936	0.996764	0.082597

Baseline Occupied Schedule

	Open Hr	Closed Hr
Mon.	7	16
Tues.	7	16
Wed.	7	16
Thrus.	7	16
Fri.	7	16
Sat.	0	24
Sun.	0	24

Proposed ***Setback***	Occupied				Unoccupied			
Bin Temp	Hours	Part Load	Part Load Efficiency	Usage Factor	Htg Avail Hours	Part Load	Part Load Efficiency	Usage Factor
-32.5	0	1.0	80.00%	0.0	0	1.0	80.00%	0.0
-27.5	0	1.0	80.00%	0.0	0	1.0	80.00%	0.0
-22.5	0	1.0	80.00%	0.0	0	1.0	80.00%	0.0
-17.5	0	1.0	80.00%	0.0	0	1.0	80.00%	0.0
-12.5	0	1.0	80.00%	0.0	0	1.0	80.00%	0.0
-7.5	0	1.0	80.00%	0.0	2	1.0	80.00%	2.5
-2.5	9	1.0	80.00%	11.3	13	1.0	80.00%	16.3
2.5	28	1.0	76.94%	34.7	31	1.0	76.94%	38.5
7.5	49	0.9	70.74%	59.8	57	0.9	70.74%	69.6
12.5	84	0.8	64.43%	100.7	92	0.8	64.43%	110.3
17.5	201	0.7	58.03%	236.2	241	0.7	58.03%	283.2
22.5	312	0.6	51.51%	357.9	219	0.6	51.51%	251.2
27.5	300	0.5	44.89%	334.1	271	0.5	44.89%	301.8
32.5	395	0.4	38.17%	423.4	377	0.4	38.17%	404.1
37.5	454	0.3	31.34%	461.0	420	0.3	31.34%	426.4
42.5	388	0.2	24.40%	361.4	253	0.2	24.40%	235.6
47.5	234	0.1	17.36%	183.8	0	0.0	0.00%	0.0
52.5	300	0.0	10.22%	133.4	0	0.0	0.00%	0.0
57.5	0	0.0	0.00%	0.0	0	0.0	0.00%	0.0
62.5	0	0.0	0.00%	0.0	0	0.0	0.00%	0.0
68.5	0	0.0	0.00%	0.0	0	0.0	0.00%	0.0
Totals	2,754			**2697.7**	1,976			**2,140**
Annual Total Usage Factor								**4,837**
Annual Usuage Factor Savings								**290**
Annual Percent Savings								**5.65%**

Proposed

	Temp	% Load
Min	0	1
Max	55	0
Full Load Efficiency:		0.8
UnOcc Setback F		8

Proposed Occupied Schedule

	Open Hr	Closed Hr
Mon.	7	16
Tues.	7	16
Wed.	7	16
Thrus.	7	16
Fri.	7	16
Sat.	0	24
Sun.	0	24

Existing Annual Consumption:		22000	Gallons
	x	5.65%	% Savings
Annual Energy Savings		**1,242.9**	**Gallons**
	x	$3.17	$/Fuel Unit
Annual Cost Savings		$ 3,940	

Gallons	BTU/Unit	MBTU
1242.9	138,690	172.38

Facility: Town of Amenia
ECM Number: ECM 5 - Heating Infiltration
ECM Description: B3 - Install Interior Storms

OCCUPIED	UNOCCUPIED	PARAMETER	
72	55	Ti	Heating Season Setpoint Temperature, F
40.8	34.9	To	Average Outdoor Temperature in Heating, F
5	5	V	Average Wind Speed in Period, MPH
1799	3,570	H	Hours Requiring Heating in Period, H
Existing	Proposed		
75	75	L	Crack Length (FT)
0.030	0.000	W	Crack Width (IN)
27.0	0.0	EA	Effective Air Leakage Area, IN^2
27.0		AI	Reduction of Effected Air Leakage Area, IN^2
2		S#	Number Of Stories (1-3)
2		SC	Sheilding Class (1-5)
0.0299		Cs	Stack Coefficient, $CFM^2/(IN^4-F)$ - From ASHRAE 97F25.22
0.0121		Cw	Wind Coefficient, $CFM^2/(IN^4-MPH^2)$ - From ASHRAE 97F25.22
80%		E	Seasonal Efficiency
gallons		FU	Fuel Unit
138,690		FCF	Fuel Conversion Factor, BTU/Fuel Unit
3.17		FC	Fuel Cost ($/Fuel Unit)

1) FLOW RATE REDUCTION, CFM = $AI*[Cs*(TI-To) + Cw*V^2]^{0.5}$

OCCUPIED PERIOD
= 27 IN^2 * [0.0299 CFM^2/(IN^4-F) * (72 F - 40.8 F) + (0.0121 CFM^2/IN^4-MPH^4 * (5 MPH)^2]^0.5
= 30.00 CFM

UNOCCUPIED PERIOD
= 27 IN^2 * [0.0299 CFM^2/(IN^4-F) * (55 F - 34.9 F) + (0.0121 CFM^2/IN^4-MPH^4 * (5 MPH)^2]^0.5
= 25.67 CFM

2) ANNUAL INPUT ENERGY SAVINGS = [1.08 * FLOW RATE * (TI - To) * H * FCF] / SEASONAL EFFICIENCY

OCCUPIED PERIOD
= [1.08 * 30 CFM * (72 F - 40.8 F) * 1799 Hrs * (MTBU /1,000,000 BTU) / 80% = 2.3 MBTU
= [1.08 * 30 CFM * (72 F - 40.8 F) * 1799 Hrs * (gallons/ 138,690 BTU)] / 80%
= 16 gallons

UNOCCUPIED PERIOD
= [1.08 * 25.7 CFM * (55 F - 34.9 F) * 3570 Hrs * (MBTU/1,000,000 BTU) / 80% = 2.5 MBTU
= [1.08 * 25.7 CFM * (55 F - 34.9 F) * 3570 Hrs * (gallons/ 138,690 BTU)] / 80%
= 18 gallons

TOTAL SAVINGS
= 4.8 MBTU
= 34 gallons

3) ANNUAL ENERGY COST SAVINGS:
= 34 gallons * (3.17 $/gallons)
= $ 109

Facility: Town of Amenia
ECM Number: ECM 5 - Heating Conduction
ECM Description: B3 - Install Interior Storms

EXISTING	PROPOSED	PARAMETER
0.88	3	R-Value, BTU/H-FT^2-F
72	72	Occupied Heating Season Setpoint Temperature, F
55	55	Unoccupied Heating Season Setpoint Temperature, F
280		Surface Area, Sf
55		Balance Point Temperature, F
80%		Season System Efficiency
gallons		Fuel Unit
138,690		Fuel Conversion Factor, BTU/ Fuel Unit
3.170		Fuel Cost in $/Fuel Unit

Average Bin Temp (F)	Area (SF)	OCCUPIED OPERATION						UNOCCUPIED OPERATION						Total Annual Energy Savings (BTU)
		Annual Hours	U-Value (1/R-Value) Existing (BTU/H-FT^2-F)	U-Value (1/R-Value) Proposed (BTU/H-FT^2-F)	Delta Temperature Existing (F)	Delta Temperature Proposed (F)	Energy Savings (BTU)	Annual Hours	U-Value (1/R-Value) Existing (BTU/H-FT^2-F)	U-Value (1/R-Value) Proposed (BTU/H-FT^2-F)	Delta Temperature Existing (F)	Delta Temperature Proposed (F)	Energy Savings (BTU)	
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
			1/Rexisting	1/Rproposed	72 F -Tbin	72 F -Tbin	(D*F-E*G)*B*C		1/Rexisting	1/Rproposed	55 F -Tbin	55 F -Tbin	(J*L-K*M)*B*I	H+N
-17.5	280	0	1.136	0.333	-	-	-	0	1.136	0.333	-	-	-	-
-12.5	280	0	1.136	0.333	-	-	-	0	1.136	0.333	-	-	-	-
-7.5	280	0	1.136	0.333	-	-	-	2	1.136	0.333	62.5	62.5	28,106	28,106
-2.5	280	3	1.136	0.333	74.5	74.5	50,254	19	1.136	0.333	57.5	57.5	245,647	295,901
2.5	280	12	1.136	0.333	69.5	69.5	187,524	47	1.136	0.333	52.5	52.5	554,814	742,337
7.5	280	19	1.136	0.333	64.5	64.5	275,562	87	1.136	0.333	47.5	47.5	929,186	1,204,738
12.5	280	45	1.136	0.333	59.5	59.5	602,032	131	1.136	0.333	42.5	42.5	1,251,844	1,853,876
17.5	280	116	1.136	0.333	54.5	54.5	1,421,492	326	1.136	0.333	37.5	37.5	2,748,773	4,170,265
22.5	280	167	1.136	0.333	49.5	49.5	1,858,710	364	1.136	0.333	32.5	32.5	2,659,958	4,518,668
27.5	280	198	1.136	0.333	44.5	44.5	1,981,140	373	1.136	0.333	27.5	27.5	2,306,383	4,287,523
32.5	280	246	1.136	0.333	39.5	39.5	2,184,853	526	1.136	0.333	22.5	22.5	2,661,082	4,845,935
37.5	280	267	1.136	0.333	34.5	34.5	2,071,192	600	1.136	0.333	17.5	17.5	2,360,909	4,432,101
42.5	280	235	1.136	0.333	29.5	29.5	1,558,762	388	1.136	0.333	12.5	12.5	1,090,515	2,649,277
47.5	280	134	1.136	0.333	24.5	24.5	738,178	278	1.136	0.333	7.5	7.5	468,809	1,206,987
52.5	280	181	1.136	0.333	19.5	19.5	793,603	257	1.136	0.333	2.5	2.5	144,465	938,068
57.5	280	176	1.136	0.333	14.5	14.5	573,813	172	1.136	0.333	-	-	-	573,813
62.5	280	0	1.136	0.333	-	-	-	0	1.136	0.333	-	-	-	-
67.5	280	0	1.136	0.333	-	-	-	0	1.136	0.333	-	-	-	-
72.5	280	0	1.136	0.333	-	-	-	0	1.136	0.333	-	-	-	-
77.5	280	0	1.136	0.333	-	-	-	0	1.136	0.333	-	-	-	-
82.5	280	0	1.136	0.333	-	-	-	0	1.136	0.333	-	-	-	-
87.5	280	0	1.136	0.333	-	-	-	0	1.136	0.333	-	-	-	-
92.5	280	0	1.136	0.333	-	-	-	0	1.136	0.333	-	-	-	-
97.5	280	0	1.136	0.333	-	-	-	0	1.136	0.333	-	-	-	-
102.5	280	0	1.136	0.333	-	-	-	0	1.136	0.333	-	-	-	-
TOTAL		1,799					14,297,103	3,570					17,450,491	31,747,594

ANNUAL ENERGY SAVINGS

= (Energy Savings * Energy Conversion Factor)/Seasonal Efficiency

= (31,747,594 BTU * gallons/138,690 BTU) / (80% EFF)= 286 gallons
= (31,747,594 BTU * (MBTU/ 1,000,000 BTU)) / (80% EFF)= 39.7 MBTU
= 286 gallons * (3.17 $/gallons)
= $ 907

Facility: Town of Amenia
ECM Number: ECM 6 - Heating Infiltration
ECM Description: B4 - Reduce Glass Area

OCCUPIED	UNOCCUPIED	PARAMETER	
72	55	Ti	Heating Season Setpoint Temperature, F
40.8	34.9	To	Average Outdoor Temperature in Heating, F
5	5	V	Average Wind Speed in Period, MPH
1799	3,570	H	Hours Requiring Heating In Period, H
Existing	Proposed		
150	150	L	Crack Length (FT)
0.030	0.000	W	Crack Width (IN)
54.0	0.0	EA	Effective Air Leakage Area, IN^2
54.0		AI	Reduction of Effected Air Leakage Area, IN^2
2		S#	Number Of Stories (1-3)
2		SC	Sheilding Class (1-5)
0.0299		Cs	Stack Coefficient, $CFM^2/(IN^4-F)$ - From ASHRAE 97F25.22
0.0121		Cw	Wind Coefficient, $CFM^2/(IN^4-MPH^2)$ - From ASHRAE 97F25.22
80%		E	Seasonal Efficiency
gallons		FU	Fuel Unit
138,690		FCF	Fuel Conversion Factor, BTU/Fuel Unit
3.17		FC	Fuel Cost ($/Fuel Unit)

1) FLOW RATE REDUCTION, CFM = $AI*[Cs*(Ti-To) + Cw*V^2]^{0.5}$

OCCUPIED PERIOD
= 54 IN^2 * [0.0299 CFM^2/(IN^4-F) * (72 F - 40.8 F) + (0.0121 CFM^2/IN^4-MPH^4 * (5 MPH)^2]^0.5
= 59.99 CFM

UNOCCUPIED PERIOD
= 54 IN^2 * [0.0299 CFM^2/(IN^4-F) * (55 F - 34.9 F) + (0.0121 CFM^2/IN^4-MPH^4 * (5 MPH)^2]^0.5
= 51.34 CFM

2) ANNUAL INPUT ENERGY SAVINGS = [1.08 * FLOW RATE * (TI - To) * H * FCF] / SEASONAL EFFICIENCY

OCCUPIED PERIOD
= [1.08 * 60 CFM * (72 F - 40.8 F) * 1799 Hrs * (MTBU /1,000,000 BTU) / 80% = 4.5 MBTU
= [1.08 * 60 CFM * (72 F - 40.8 F) * 1799 Hrs * (gallons/ 138,690 BTU)] / 80%
= 33 gallons

UNOCCUPIED PERIOD
= [1.08 * 51.3 CFM * (55 F - 34.9 F) * 3570 Hrs * (MBTU/1,000,000 BTU) / 80% = 5. MBTU
= [1.08 * 51.3 CFM * (55 F - 34.9 F) * 3570 Hrs * (gallons/ 138,690 BTU)] / 80%
= 36 gallons

TOTAL SAVINGS
= 9.5 MBTU
= 69 gallons

3) ANNUAL ENERGY COST SAVINGS:
= 69 gallons * (3.17 $/gallons)
= $ 218

Facility: Town of Amenia
ECM Number: ECM 6 - Heating Conduction
ECM Description: B4 - Reduce Glass Area

EXISTING	PROPOSED	PARAMETER
0.88	19	R-Value, BTU/H-FT^2-F
72	72	Occupied Heating Season Setpoint Temperature, F
55	55	Unoccupied Heating Season Setpoint Temperature, F
450		Surface Area, Sf
55		Balance Point Temperature, F
80%		Season System Efficiency
gallons		Fuel Unit
138,690		Fuel Conversion Factor, BTU/ Fuel Unit
3.170		Fuel Cost in $/Fuel Unit

Average Bin Temp (F)	Area (SF)	OCCUPIED OPERATION						UNOCCUPIED OPERATION						Total Annual Energy Savings (BTU)
		Annual Hours	U-Value (1/R-Value) Existing (BTU/H-FT^2-F)	U-Value (1/R-Value) Proposed (BTU/H-FT^2-F)	Delta Temperature Existing (F)	Delta Temperature Proposed (F)	Energy Savings (BTU)	Annual Hours	U-Value (1/R-Value) Existing (BTU/H-FT^2-F)	U-Value (1/R-Value) Proposed (BTU/H-FT^2-F)	Delta Temperature Existing (F)	Delta Temperature Proposed (F)	Energy Savings (BTU)	
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
			1/Rexisting	1/Rproposed	72 F -Tbin	72 F -Tbin	(D*F-E*G)*B*C		1/Rexisting	1/Rproposed	55 F -Tbin	55 F -Tbin	(J*L-K*M)*B*I	H+N
-17.5	450	0	1.136	0.053	-	-	-	0	1.136	0.053	-	-	-	-
-12.5	450	0	1.136	0.053	-	-	-	0	1.136	0.053	-	-	-	-
-7.5	450	0	1.136	0.053	-	-	-	2	1.136	0.053	62.5	62.5	60,960	60,960
-2.5	450	3	1.136	0.053	74.5	74.5	108,996	19	1.136	0.053	57.5	57.5	532,790	641,786
2.5	450	12	1.136	0.053	69.5	69.5	406,725	47	1.136	0.053	52.5	52.5	1,203,349	1,610,074
7.5	450	19	1.136	0.053	64.5	64.5	597,651	87	1.136	0.053	47.5	47.5	2,015,335	2,612,986
12.5	450	45	1.136	0.053	59.5	59.5	1,305,762	131	1.136	0.053	42.5	42.5	2,715,155	4,020,917
17.5	450	116	1.136	0.053	54.5	54.5	3,083,109	326	1.136	0.053	37.5	37.5	5,961,881	9,044,990
22.5	450	167	1.136	0.053	49.5	49.5	4,031,402	364	1.136	0.053	32.5	32.5	5,769,248	9,800,650
27.5	450	198	1.136	0.053	44.5	44.5	4,296,943	373	1.136	0.053	27.5	27.5	5,002,372	9,299,315
32.5	450	246	1.136	0.053	39.5	39.5	4,738,781	526	1.136	0.053	22.5	22.5	5,771,686	10,510,467
37.5	450	267	1.136	0.053	34.5	34.5	4,492,259	600	1.136	0.053	17.5	17.5	5,120,634	9,612,893
42.5	450	235	1.136	0.053	29.5	29.5	3,380,838	388	1.136	0.053	12.5	12.5	2,365,245	5,746,083
47.5	450	134	1.136	0.053	24.5	24.5	1,601,052	278	1.136	0.053	7.5	7.5	1,016,812	2,617,863
52.5	450	181	1.136	0.053	19.5	19.5	1,721,265	257	1.136	0.053	2.5	2.5	313,334	2,034,599
57.5	450	176	1.136	0.053	14.5	14.5	1,244,558	172	1.136	0.053	-	-	-	1,244,558
62.5	450	0	1.136	0.053	-	-	-	0	1.136	0.053	-	-	-	-
67.5	450	0	1.136	0.053	-	-	-	0	1.136	0.053	-	-	-	-
72.5	450	0	1.136	0.053	-	-	-	0	1.136	0.053	-	-	-	-
77.5	450	0	1.136	0.053	-	-	-	0	1.136	0.053	-	-	-	-
82.5	450	0	1.136	0.053	-	-	-	0	1.136	0.053	-	-	-	-
87.5	450	0	1.136	0.053	-	-	-	0	1.136	0.053	-	-	-	-
92.5	450	0	1.136	0.053	-	-	-	0	1.136	0.053	-	-	-	-
97.5	450	0	1.136	0.053	-	-	-	0	1.136	0.053	-	-	-	-
102.5	450	0	1.136	0.053	-	-	-	0	1.136	0.053	-	-	-	-
TOTAL		1,799					31,009,340	3,570					37,848,800	68,858,140

ANNUAL ENERGY SAVINGS

= (Energy Savings * Energy Conversion Factor)/Seasonal Efficiency

= (68,858,140 BTU * gallons/138,690 BTU) / (80% EFF)= 621 gallons
= (68,858,140 BTU * (MBTU/ 1,000,000 BTU)) / (80% EFF)= 86.1 MBTU
= 621 gallons * (3.17 $/gallons)
= $ 1,967

Facility: Town of Amenia
ECM Number: ECM 7 - Heating Conduction
ECM Description: B8 - Insulate Ceiling

EXISTING	PROPOSED	PARAMETER
9	29	R-Value, BTU/H-FT^2-F
72	72	Occupied Heating Season Setpoint Temperature, F
55	55	Unoccupied Heating Season Setpoint Temperature, F
10,000		Surface Area, Sf
55		Balance Point Temperature, F
80%		Season System Efficiency
gallons		Fuel Unit
138,690		Fuel Conversion Factor, BTU/ Fuel Unit
3.170		Fuel Cost in $/Fuel Unit

Average Bin Temp (F)	Area (SF)	OCCUPIED OPERATION						UNOCCUPIED OPERATION						Total Annual Energy Savings (BTU)
		Annual Hours	U-Value (1/R-Value) Existing (BTU/H-FT^2-F)	U-Value (1/R-Value) Proposed (BTU/H-FT^2-F)	Delta Temperature Existing (F)	Delta Temperature Proposed (F)	Energy Savings (BTU)	Annual Hours	U-Value (1/R-Value) Existing (BTU/H-FT^2-F)	U-Value (1/R-Value) Proposed (BTU/H-FT^2-F)	Delta Temperature Existing (F)	Delta Temperature Proposed (F)	Energy Savings (BTU)	
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
			1/Rexisting	1/Rproposed	72 F -Tbin	72 F -Tbin	(D*F-E*G)*B*C		1/Rexisting	1/Rproposed	55 F -Tbin	55 F -Tbin	(J*L-K*M)*B*I	H+N
-17.5	10,000	0	0.111	0.034	-	-	-	0	0.111	0.034	-	-	-	-
-12.5	10,000	0	0.111	0.034	-	-	-	0	0.111	0.034	-	-	-	-
-7.5	10,000	0	0.111	0.034	-	-	-	2	0.111	0.034	62.5	62.5	95,785	95,785
-2.5	10,000	3	0.111	0.034	74.5	74.5	171,264	19	0.111	0.034	57.5	57.5	837,165	1,008,429
2.5	10,000	12	0.111	0.034	69.5	69.5	639,080	47	0.111	0.034	52.5	52.5	1,890,805	2,529,885
7.5	10,000	19	0.111	0.034	64.5	64.5	939,080	87	0.111	0.034	47.5	47.5	3,166,667	4,105,747
12.5	10,000	45	0.111	0.034	59.5	59.5	2,051,724	131	0.111	0.034	42.5	42.5	4,266,284	6,318,008
17.5	10,000	116	0.111	0.034	54.5	54.5	4,844,444	326	0.111	0.034	37.5	37.5	9,367,816	14,212,261
22.5	10,000	167	0.111	0.034	49.5	49.5	6,334,483	364	0.111	0.034	32.5	32.5	9,065,134	15,399,617
27.5	10,000	198	0.111	0.034	44.5	44.5	6,751,724	373	0.111	0.034	27.5	27.5	7,860,153	14,611,877
32.5	10,000	246	0.111	0.034	39.5	39.5	7,445,977	526	0.111	0.034	22.5	22.5	9,068,966	16,514,943
37.5	10,000	267	0.111	0.034	34.5	34.5	7,058,621	600	0.111	0.034	17.5	17.5	8,045,977	15,104,598
42.5	10,000	235	0.111	0.034	29.5	29.5	5,312,261	388	0.111	0.034	12.5	12.5	3,716,475	9,028,736
47.5	10,000	134	0.111	0.034	24.5	24.5	2,515,709	278	0.111	0.034	7.5	7.5	1,597,701	4,113,410
52.5	10,000	181	0.111	0.034	19.5	19.5	2,704,598	257	0.111	0.034	2.5	2.5	492,337	3,196,935
57.5	10,000	176	0.111	0.034	14.5	14.5	1,955,556	172	0.111	0.034	-	-	-	1,955,556
62.5	10,000	0	0.111	0.034	-	-	-	0	0.111	0.034	-	-	-	-
67.5	10,000	0	0.111	0.034	-	-	-	0	0.111	0.034	-	-	-	-
72.5	10,000	0	0.111	0.034	-	-	-	0	0.111	0.034	-	-	-	-
77.5	10,000	0	0.111	0.034	-	-	-	0	0.111	0.034	-	-	-	-
82.5	10,000	0	0.111	0.034	-	-	-	0	0.111	0.034	-	-	-	-
87.5	10,000	0	0.111	0.034	-	-	-	0	0.111	0.034	-	-	-	-
92.5	10,000	0	0.111	0.034	-	-	-	0	0.111	0.034	-	-	-	-
97.5	10,000	0	0.111	0.034	-	-	-	0	0.111	0.034	-	-	-	-
102.5	10,000	0	0.111	0.034	-	-	-	0	0.111	0.034	-	-	-	-
TOTAL		1,799					48,724,521	3,570					59,471,264	108,195,785

ANNUAL ENERGY SAVINGS

= (Energy Savings * Energy Conversion Factor)/Seasonal Efficiency

= (108,195,785 BTU * gallons/138,690 BTU) / (80% EFF)= 975 gallons
= (108,195,785 BTU * (MBTU/ 1,000,000 BTU)) / (80% EFF)= 135.2 MBTU
= 975 gallons * (3.17 $/gallons)
= $ 3,091

Facility: Town of Amenia
ECM Number: ECM 8 - Heating Conduction
ECM Description: B13 - Insulate Walls

EXISTING	PROPOSED	PARAMETER
9	19	R-Value, BTU/H-FT^2-F
72	72	Occupied Heating Season Setpoint Temperature, F
55	55	Unoccupied Heating Season Setpoint Temperature, F
12,477		Surface Area, Sf
55		Balance Point Temperature, F
80%		Season System Efficiency
gallons		Fuel Unit
138,690		Fuel Conversion Factor, BTU/ Fuel Unit
3.170		Fuel Cost in $/Fuel Unit

Average Bin Temp (F)	Area (SF)	OCCUPIED OPERATION						UNOCCUPIED OPERATION						Total Annual Energy Savings (BTU)
		Annual Hours	U-Value (1/R-Value) Existing (BTU/H-FT^2-F)	U-Value (1/R-Value) Proposed (BTU/H-FT^2-F)	Delta Temperature Existing (F)	Delta Temperature Proposed (F)	Energy Savings (BTU)	Annual Hours	U-Value (1/R-Value) Existing (BTU/H-FT^2-F)	U-Value (1/R-Value) Proposed (BTU/H-FT^2-F)	Delta Temperature Existing (F)	Delta Temperature Proposed (F)	Energy Savings (BTU)	
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
			1/Rexisting	1/Rproposed	72 F -Tbin	72 F -Tbin	(D*F-E*G)*B*C		1/Rexisting	1/Rproposed	55 F -Tbin	55 F -Tbin	(J*L-K*M)*B*I	H+N
-17.5	12,477	0	0.111	0.053	-	-	-	0	0.111	0.053	-	-	-	-
-12.5	12,477	0	0.111	0.053	-	-	-	0	0.111	0.053	-	-	-	-
-7.5	12,477	0	0.111	0.053	-	-	-	2	0.111	0.053	62.5	62.5	91,206	91,206
-2.5	12,477	3	0.111	0.053	74.5	74.5	163,077	19	0.111	0.053	57.5	57.5	797,142	960,218
2.5	12,477	12	0.111	0.053	69.5	69.5	608,527	47	0.111	0.053	52.5	52.5	1,800,409	2,408,937
7.5	12,477	19	0.111	0.053	64.5	64.5	894,185	87	0.111	0.053	47.5	47.5	3,015,275	3,909,460
12.5	12,477	45	0.111	0.053	59.5	59.5	1,953,636	131	0.111	0.053	42.5	42.5	4,062,321	6,015,957
17.5	12,477	116	0.111	0.053	54.5	54.5	4,612,842	326	0.111	0.053	37.5	37.5	8,919,961	13,532,802
22.5	12,477	167	0.111	0.053	49.5	49.5	6,031,644	364	0.111	0.053	32.5	32.5	8,631,749	14,663,394
27.5	12,477	198	0.111	0.053	44.5	44.5	6,428,938	373	0.111	0.053	27.5	27.5	7,484,376	13,913,314
32.5	12,477	246	0.111	0.053	39.5	39.5	7,090,001	526	0.111	0.053	22.5	22.5	8,635,397	15,725,398
37.5	12,477	267	0.111	0.053	34.5	34.5	6,721,163	600	0.111	0.053	17.5	17.5	7,661,316	14,382,479
42.5	12,477	235	0.111	0.053	29.5	29.5	5,058,293	388	0.111	0.053	12.5	12.5	3,538,798	8,597,091
47.5	12,477	134	0.111	0.053	24.5	24.5	2,395,438	278	0.111	0.053	7.5	7.5	1,521,318	3,916,756
52.5	12,477	181	0.111	0.053	19.5	19.5	2,575,297	257	0.111	0.053	2.5	2.5	468,800	3,044,096
57.5	12,477	176	0.111	0.053	14.5	14.5	1,862,065	172	0.111	0.053	-	-	-	1,862,065
62.5	12,477	0	0.111	0.053	-	-	-	0	0.111	0.053	-	-	-	-
67.5	12,477	0	0.111	0.053	-	-	-	0	0.111	0.053	-	-	-	-
72.5	12,477	0	0.111	0.053	-	-	-	0	0.111	0.053	-	-	-	-
77.5	12,477	0	0.111	0.053	-	-	-	0	0.111	0.053	-	-	-	-
82.5	12,477	0	0.111	0.053	-	-	-	0	0.111	0.053	-	-	-	-
87.5	12,477	0	0.111	0.053	-	-	-	0	0.111	0.053	-	-	-	-
92.5	12,477	0	0.111	0.053	-	-	-	0	0.111	0.053	-	-	-	-
97.5	12,477	0	0.111	0.053	-	-	-	0	0.111	0.053	-	-	-	-
102.5	12,477	0	0.111	0.053	-	-	-	0	0.111	0.053	-	-	-	-
TOTAL		1,799					46,395,104	3,670					56,628,068	103,023,173

ANNUAL ENERGY SAVINGS

= (Energy Savings * Energy Conversion Factor)/Seasonal Efficiency

= (103,023,173 BTU * gallons/138,690 BTU) / (80% EFF)= 929 gallons
= (103,023,173 BTU * (MBTU/ 1,000,000 BTU)) / (80% EFF)= 128.8 MBTU
= 929 gallons * (3.17 $/gallons)
= $ 2,943

Town of Amenia Town Hall

ECM 9 W7 - Install 7 Day Timer on Water Heater

	Water Parameters		Electric Demand Parameters				Fuel Parameters				Annual Savings			
ECM	Water Cost per Thous Gal	Annual Water Cost Savings	kW Savings	kW Cost ($/kW-Mo)	# of Months w/ kW Svgs	Annual Demand Savings ($)	Fuel Type	Fuel Units	Fuel Cost ($/Fuel Unit)	Fuel Conv (Btu/Fuel Unit)	Energy Savings (MMBtus)	Fuel Savings (Fuel Unit)	Fuel Cost Savings ($)	Total Annual Savings
		$0.00	1.5	$8.10	12	$145.80	Electricity	kWhs	$0.140	3,413	0.0	0	$0	$146

RETURN FORM:
To the audit customer - once you have followed through at least one recommendation from this report at least equal or higher cost than your $100 or $400 fee, tear out this letter, date and sign it, and attach a photocopy of your receipt for whatever recommended measure you had purchased. Mail both the letter and receipt to the NYSERDA program manager's name and address shown below.

Feel free to cross out and update any contact information if it is not correct.

Date: _____

NYSERDA
Tim Gilroy, Program Manager
17 Columbia Circle
Albany, NY 12203-6399
(518) 862-1090 ext. 3220

RE: Request for return of audit fee – Small Commercial Energy Audit Program
Town of Amenia Town Hall
Audit Number: 1057
4900 Route 22
Amenia, NEW YORK 12501

Mr. Gilroy:

We have followed through on at least one recommendation equal to the fee we had paid for the audit, and we would like to request the return of our audit fee per the Program rules. We have attached the photocopy of our receipt to show we have purchased or installed at least one of the measures recommended in the NYSERDA audit report, and that this was equal or higher in cost than our fee.

Sincerely,

Wayne Euvrard